Determining Water Quality Functions of Wetlands – How Do We Do It?

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Efforts to preserve or restore wetlands often focus on functions such as wildlife habitat and water quality improvements. Several techniques exist for quantifying wildlife habitat but quantification of water quality functions has not been attempted extensively. While much is known about water quality processes in wetlands, methods to quantify water quality functions for mitigation and restoration have not been fully developed. Efforts currently being investigated to quantify water quality functions utilize a mass balance approach to quantify retention and export of water quality constituents. Two approaches are presented for discussion. In the first study, hypothetical mass balances are used to evaluate relative changes between alternatives for a flood control project. Environmental concerns include the loss of water quality improvement associated with a temporal change and a reduction in flooding of prior converted wetlands. The study area is about 38,000 acres in size and would require extensive and costly sampling. This approach is unique in that it attempts to provide a method to evaluate project alternatives in the absence of sufficient site-specific data to estimate material processing as a function of land cover type. The need for additional research on the effects of flooding various land cover types on water quality is also recognized. In the second study, site-specific data are used to estimate mass balances for selected water quality constituents at a wetland site that is being considered for a dredge and fill activity. Environmental concerns include the loss of wetland function for water quality. The site retains and exports material seasonally and how to use estimates of material retention and transport to determine loss of function is not clear. Recommendations include giving primary input on determining water quality function to local and state agencies and to consider the site within a broader regional context. Input from the audience will be encouraged.